



Docket No.: M4065.0485/P485  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Glen Hush, et al.

Application No.: 10/087,744

Filed: March 5, 2002

For: PROGRAMMABLE CONDUCTOR  
RANDOM ACCESS MEMORY AND  
METHOD FOR SENSING SAME

Group Art Unit: 2818

Examiner: T. Le

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**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. § 1.56, the attention of the Patent and Trademark Office is hereby directed to the documents listed on the attached PTO/SB/08. It is respectfully requested that the subject matter of the documents be expressly considered during the prosecution of this application and that the documents be made of record therein and appear among the "References Cited" on any patent to issue from this application. A copy of each document is attached.

This Supplemental Information Disclosure Statement is being filed concurrently with an Amendment.

A brief explanation of relevance of certain non-patent documents listed on Form PTO/SB/08 is provided and attached hereto as Appendix A. The brief explanation provided for each document is not tantamount to an admission that a document is "material" or that it qualifies as prior art. The Examiner is respectfully requested to utilize

Appendix A only as a tool by which to better categorize the documents for substantive use in examining the claims of the application.

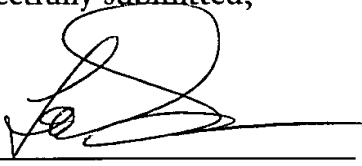
Documents discussed in Appendix A marked with an asterisk (\*) are indicated to be potentially more relevant than others. Such marking is provided only to assist the Examiner; however, the Examiner is requested to thoroughly review all documents cited herein.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Supplemental Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 C.F.R. § 1.56(a) exists. It is submitted that this Supplemental Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider and cite the listed documents.

Pursuant to 37 C.F.R. § 1.17(p), the Director is authorized to charge the \$180.00 fee for submission of this Supplemental Information Disclosure Statement to the undersigned attorneys' credit card. Form PTO-2038 is attached. In addition, the Director is authorized to charge any deficiency in the fees filed, asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm), or credit any overpayment, to our Deposit Account No. 04-1073, under Order No. M4065.0485/P485.

Dated: August 15, 2003

Respectfully submitted,

By 

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## APPENDIX A

Japanese patent application publication No. 56126916A by Akira: this published application generally relates to, inter alia, diffusing selenium with high accuracy into a chalcogenide with silver by use of photoresist and thermal treatment.

\*Axon Technologies Corp., *Technology Description: Programmable Metallization Cell*: this believed publication generally relates to, inter alia, use of chalcogenides doped with metal much as silver or copper to create solid state switch with lower voltage requirement.

Helbert et al., SPIE Vol. 333 Submicron Lithography (1982): this publication generally relates to, inter alia, hybrid ultragraphic process using both electron beam and conventional optical exposure within the same device level with a photoresist.

Hilt, dissertation (1999): this publication generally relates to, inter alia, stability of chalcogenides such as  $\text{Ge}_x\text{Se}_{1-x}$  with Ag doping by photodissolution and thermal diffusion.

Hirose et al., Phys. Stat. Sol. (1980): this publication generally relates to, inter alia, switch and memory phenomena in amorphous  $\text{As}_2\text{S}_3$  with photo-doped Ag, including new mechanism, electrical reliability, rapid memory performance, thermal characteristics and durability

Holmquist et al., 62 J. Amer. Ceram. Soc., No. 3-4 (March-April 1979): this publication generally relates to, inter alia, reactions and diffusion of Ag in arsenic chalcogenide glass below the glass transition temperature, including solubility information and concentration dependence of Ag diffusion in these glasses.

Huggett et al., 42 Appl. Phys. Lett., No. 7 (April 1983): this publication generally relates to, inter alia, reactive sputter etching to develop silver-sensitized  $\text{Ge}_x\text{Se}_{1-x}$  photoresist.

Kawaguchi et al., 164-166 J. Non-Cryst. Solids (1993): this publication generally relates to, inter alia, deposition mechanism of Ag particles on Ag-rich Ag-As-S glass from a view-point of electrical effects.

\*Kolobov and Elliott, Advances in Physics (1991): this publication generally relates to, inter alia, photodoping (photodiffusion/photodissolution) of amorphous chalcogenides by metals, particularly silver.

\*Kozicki et al., Superlattices and Microstructures, 27 (2000): this publication generally relates to, inter alia, solid solutions of metals (e.g., silver) in arsenic trisulfide and their physical and electrical characteristics.

\*Kozicki et al., Microelectronic Engineering, vol. 63/1-3 (2002): this publication generally relates to, inter alia, the photodiffusion of Ag into germanium selenide glass films, the amount of Ag that can be incorporated in to such a film by photodiffusion, and the characteristics of the resulting doped films.

\*Kozicki et al., Proceedings of the 1999 Symposium on Solid State Ionic Devices (1999): this publication generally relates to, inter alia, physical and electrical characteristics of metal doped chalcogenide films (photodoped  $\text{Ag}_4\text{As}_2\text{S}_3$ ) between electrodes, useful in memories, configurable connections, and self-repairing interconnections.

\*Kozicki and Mitkova, Proceedings of the XIX International Congress on Glass, Society for Glass Technology (2001): this publication generally relates to, inter alia, the physical effects of introduction of Ag into chalcogenide glasses, where introduction is by photodiffusion.

McHardy et al., 20 J. Phys. C.: Solid State Phys. (1987): this publication generally relates to, inter alia, sensitivity and high resolution of metals in amorphous chalcogenides by electron and UV radiation.

Owen et al., Nanostructure Physics and Fabrication (1989): this publication generally relates to, inter alia, photo-induced structural or physico-chemical changes of amorphous chalcogenides when exposed to light/irradiation, affecting chemical solubility.

Shimizu et al., 46 B. Chem Soc. Japan, No. 12 (1973): this publication generally relates to, inter alia, electric conductivity increase by increasing Ag-photodoping of chalcogenide glass.



PTO/SB/08A (10-01)

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U. S. Patent and Trademark Office: U. S. DEPARTMENT OF COMMERCE

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Substitute for form 1449A/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  <i>(use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	10/087,744
				Filing Date	March 5, 2002
				First Named Inventor	Glen Hush
				Art Unit	2818
				Examiner Name	T. Le
Sheet	1	of	4	Attorney Docket Number	M4065.0485/P485

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
	AA	6,469,364	10/2002	Kozicki	
	AB	2002/0168820 App.	11/2002	Kozicki	
	AC	2000/0072188 App	6/2002	Gilton	
	AD	2002/0123169 App	9/2002	Moore et al.	
	AE	2002/0123248 App.	9/2002	Moore et al.	
	AF	3,622,319	11/1971	Sharp	
	AG	3,743,847	7/1973	Boland	
	AH	4,269,935	5/1981	Masters et al.	
	AI	4,312,938	1/1982	Drexler, et al.	
	AJ	4,316,946	1/1982	Masters, et al.	
	AK	4,320,191	3/1982	Yoshikawa et al.	
	AL	4,405,710	9/1983	Balasubramanyam et al.	
	AM	4,419,421	12/1983	Wichelhaus, et al.	
	AN	4,795,657	1/1989	Formigoni et al.	
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	AR	5,219,788	6/1993	Abernathey et al.	
	AS	5,238,862	8/1993	Blalock et al.	
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	AU	5,350,484	9/1994	Gardner et al.	
	AV	5,360,981	11/1994	Owen et al.	
	AW	5,512,328	4/1996	Yoshimura et al.	
	AX	5,512,773	4/1996	Wolf et al.	
	AY	5,726,083	3/1998	Takaishi	
	AA1	5,841,150	11/1998	Gonzalez et al.	
	AB1	5,846,889	12/1998	Harbison et al.	
	AC1	5,920,788	7/1999	Reinberg	
	AD1	5,998,066	12/1999	Block et al.	
	AE1	6,077,729	6/2000	Harshfield	
	AF1	6,117,720	9/2000	Harshfield	
	AG1	6,143,604	11/2000	Chiang et al.	
	AH1	6,177,338	1/2001	Liaw et al.	
	AI1	6,236,059	5/2001	Wolstenholme et al.	
	AJ1	6,297,170	10/2001	Gabriel et al.	
	AK1	6,300,684	10/2001	Gonzalez et al.	
	AL1	6,316,784	11/2001	Zahorik et al.	
	AM1	6,329,606	12/2001	Freyman et al.	
	AN1	6,350,679	2/2002	McDaniel et al.	
	AO1	6,376,284	4/2002	Gonzalez et al.	
	AP1	6,391,688	5/2002	Gonzalez et al.	
	AQ1	6,414,376	7/2002	Thakur et al.	
	AR1	6,423,628	7/2002	Li et al.	
	AS1	6,487,106	11/26/2002	Kozicki	
	AT1	5,314,772	5/24/1994	Kozicki	

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STATEMENT BY APPLICANT**

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Application Number	10/087,744
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Attorney Docket Number	M4065.0485/P485

Sheet	2	of	4
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AU1	2002/0190350 APP	12/19/2002	Kozicki	
AV1	2003/0027416 APP	2/6/2003	Moore	
AW1	2003/0001229 APP	1/2/2003	Moore et al.	
AX1	2002/0106849 APP	8/8/2002	Moore	
AY1	2002/0127886 APP	9/12/2002	Moore et al.	
AZ1	2002/0123170 APP	9/5/2002	Moore et al.	
BA1	2002/0163828 APP	11/2002	Krieger et al	
BB1	6,072,716	6/2000	Jacobson et al.	
BC1	5,272,359	12/93	Nagasubramanian et al.	
BD1	4,671,618	6/87	Wu et al.	
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FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)				
	BA	JP 56126916 A	10/1981	Akira et al.		
	BB	WO 00/48196 A1	08/2000	Arizona Board of Regents		
	BC	WO 02/21542 A1	03/2002	Axon Technologies Corp.		

Examiner Signature		Date Considered	
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See attached Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the application number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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Application Number

10/087 744

**Filing Date**

March 5, 2002

**First Named Inventor**

Glen Hush

Group Art Unit

2818

Examiner Name

T. Le

Attorney Docket Number

**M4065.0485/P485**

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